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INTERNATIONAL ATOMIC WEIGHTS, 1957.

[*Reprinted from the Report of the Commission on Atomic Weights in the* Comptes rendus *of the 19th Conference of the International Union of Pure and Applied Chemistry, 1957.*]

Alphabetical order.

Name.	Symbol.	Atomic No.	Atomic weight.
Actinium	Ac	89	—
Aluminium	Al	13	26·98
Americium	Am	95	—
Antimony	Sb	51	121·76
Argon	A *	18	39·944
Arsenic	As	33	74·91
Astatine	At	85	—
Barium	Ba	56	137·36
Berkelium	Bk	97	—
Beryllium	Be	4	9·013
Bismuth	Bi	83	209·00
Boron	B	5	10·82
Bromine	Br	35	79·916
Cadmium	Cd	48	112·41
Cæsium	Cs	55	132·91
Calcium	Ca	20	40·08
Californium	Cf	98	—
Carbon	C	6	12·011
Cerium	Ce	58	140·13
Chlorine	Cl	17	35·457
Chromium	Cr	24	52·01
Cobalt	Co	27	58·94
Copper	Cu	29	63·54
Curium	Cm	96	—
Dysprosium	Dy	66	162·51
Einsteinium	Es	99	—
Erbium	Er	68	167·27
Europium	Eu	63	152·0
Fermium	Fm	100	—
Fluorine	F	9	19·00
Francium	Fr	87	—
Gadolinium	Gd	64	157·26
Gallium	Ga	31	69·72
Germanium	Ge	32	72·60
Gold	Au	79	197·0
Hafnium	Hf	72	178·50
Helium	He	2	4·003
Holmium	Ho	67	164·94
Hydrogen	H	1	1·0080
Indium	In	49	114·82
Iodine	I	53	126·91
Iridium	Ir	77	192·2
Iron	Fe	26	55·85
Krypton	Kr	36	83·80
Lanthanum	La	57	138·92
Lead	Pb	82	207·21
Lithium	Li	3	6·940
Lutetium	Lu	71	174·99
Magnesium	Mg	12	24·32
Manganese	Mn	25	54·94
Mendelevium	Md	101	—
Mercury	Hg	80	200·61
Molybdenum	Mo	42	95·95
Neodymium	Nd	60	144·27
Neon	Ne	10	20·183
Neptunium	Np	93	—
Nickel	Ni	28	58·71
Niobium	Nb	41	92·91
Nitrogen	N	7	14·008
Nobelium	No	102	—
Osmium	Os	76	190·2
Oxygen	O	8	16
Palladium	Pd	46	106·4
Phosphorus	P	15	30·975
Platinum	Pt	78	195·09
Plutonium	Pu	94	—
Polonium	Po	84	—
Potassium	K	19	39·100
Praseodymium	Pr	59	140·92
Promethium	Pm	61	—
Protactinium	Pa	91	—
Radium	Ra	88	—
Radon	Rn	86	—
Rhenium	Re	75	186·22
Rhodium	Rh	45	102·91
Rubidium	Rb	37	85·48
Ruthenium	Ru	44	101·1
Samarium	Sm	62	150·35
Scandium	Sc	21	44·96
Selenium	Se	34	78·96
Silicon	Si	14	28·09
Silver	Ag	47	107·880
Sodium	Na	11	22·991
Strontium	Sr	38	87·63
Sulphur	S	16	32·066†
Tantalum	Ta	73	180·95
Technetium	Tc	43	—
Tellurium	Te	52	127·61
Terbium	Tb	65	158·93
Thallium	Tl	81	204·39
Thorium	Th	90	232·05
Thulium	Tm	69	168·94
Tin	Sn	50	118·70
Titanium	Ti	22	47·90
Tungsten	W	74	183·86
Uranium	U	92	238·07
Vanadium	V	23	50·95
Xenon	Xe	54	131·30
Ytterbium	Yb	70	173·04
Yttrium	Y	39	88·92
Zinc	Zn	30	65·38
Zirconium	Zr	40	91·22

* The International Table uses the symbol Ar for argon but this has not been adopted by The Chemical Society.

† Because of natural variations in the relative abundance of the isotopes of sulphur the atomic weight of this element has a range of ±0·003.

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EDITORIAL REPORT ON NOMENCLATURE, 1957.*

Definitive rules of nomenclature for inorganic chemistry, a further large section of the definitive rules of nomenclature for organic chemistry, definitive rules of nomenclature of steroids, and tentative rules of nomenclature of vitamin B_{12} were approved at the meeting of the International Union of Pure and Applied Chemistry at Paris in 1957, and their publication is expected during 1958. Until this publication becomes available and has been considered by The Chemical Society these new rules will not be discussed in these Editorial Nomenclature Reports. The Editor may, however, be able to provide guidance to those concerned with specialised aspects.

In view of these forthcoming publications, and for other reasons, nomenclature in the Society's publications during 1957 has been mainly on established lines. The problems that have arisen have been mostly of specialist interest, but the following few points may be mentioned here.

(1) The term " double-bonding ligand " indicates a ligand which possesses a strong σ-bond and also a strong π-bond. The terms " π-bonding ligand " and " σ-bonding ligand " refer to ligands which form bonds deriving their strength mainly from π-bonds and σ-bonds respectively. This distinction between the σ-bond strengths of ligands possessing π-bonds in addition is important in discussions of stabilities and of directive effects in complex compounds. Thus the " *trans*-directing " properties of the ligands CO, PCl_3, PF_3, C_2H_4, methyldiphenylarsine, and *o*-phenylenebisdimethylarsine are all fairly high, but the relative stabilities of platinum(II) compounds involving these ligands differ markedly with respect to heat, moisture, and excess of ligand (*J.*, 1957, 2018).

(2) A nomenclature generally adaptable for mesoionic compounds (sydnones, etc.) is badly needed but not yet in sight. In the meanwhile, use of the prefix ψ is probably the best available (cf. *J.*, 1957, 1556) when trivial names such as sydnone do not exist.

(3) Problems in stereochemistry arise with increasing frequency. Solutions (perhaps only temporary) of three problems during the year may find analogous uses.

(*a*) It was necessary to distinguish the three stereoisomeric 1 : 5-dichloroanthraquinone dioximes (*J.*, 1957, 1901). The terms *syn* and *anti* were used to describe the mutual stereochemical relations of the oxime groups, and *cis* and *trans* to describe the configurations of these groups with respect to the nearer chlorine atom.

(*b*) In a paper dealing with cyclitol derivatives (*J.*, 1957, 3691) the most satisfactory method of designating the (absolute) configuration at each asymmetric centre was the *R*, *S* symbolism (Cahn, Ingold, and Prelog, *Experientia*, 1956, **12**, 81) but this obscured the *cis-trans*-relations which are the characteristic feature of this field. The solution adopted was to use the customary inositol-type of nomenclature supplemented by the *R* or *S* symbol for the lowest-numbered asymmetric centre. This method is capable of wide application.

(*c*) A situation arose where conversion of a sugar into its alcohol introduced an additional element of symmetry in such a way that strict application of nomenclature rules obscured the chemical relations. D-Ribitol 5-phosphate is the same substance as L-ribitol 1-phosphate. According to the standard rules of nomenclature, the name with the lower number should have preference, *i.e.*, L-ribitol 1-phosphate. Nevertheless, D-ribitol 5-phosphate was used in the paper (*J.*, 1957, 1870) because of its use in previous papers and because the substance is probably related metabolically to D-ribose 5-phosphate and D-ribulose 5-phosphate and is degraded to D-glyceric acid. Moreover, it was important to avoid the possible implication that L-ribitol 1-phosphate is in any way related to L-α-glycerophosphoric acid. These two compounds are, in fact, in stereochemically opposite series. The correct name for the naturally occurring

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* Reprints of this Report and of those for each of the years 1950—1956 (except 1952, which is out of print) may be obtained from the General Secretary, The Chemical Society, price 1*s.* each (post free).

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L-α-glycerophosphoric acid, according to standard rules of nomenclature, is D-glycerol 1-(dihydrogen phosphate) (equivalent to the 3-phosphate). However, probably for reasons concerning its biochemical origin, the L-α or L-3 nomenclature has always been adopted for this compound.

(4) Attention is directed to two bad practices which are becoming increasingly common in chemical papers. One is the loose use of words ending in " lysis ". Lysis denotes fission; " heterolytic fission " is a tautological phrase. In fact, great care is needed in use of " lysis." In chemistry it means " fission by ", *e.g.*, electrolysis, hydrolysis, solvolysis, pyrolysis. Homolysis and heterolysis are exceptions, for they denote fission of a bond *in* an electronically symmetrical and asymmetrical manner, respectively. But in biochemistry and biology the term lysis usually denotes fission *of*, *e.g.*, amylolytic, carcinolysis, lipolysis, plasmolysis. In chemical papers the chemical usage of " fission *by* " should be adhered to. Better, such terms should be restricted to well-established ones or to cases where no simple alternative is available: words such as chlorinolysis and diazomethanolysis are pure jargon. And the use of, *e.g.*, acetolysis to denote fission *of* an acetate group is inexcusable.

A second is tautological use of such words as reaction, process, etc., as in " reduction process ", " hydrogenation reaction ".

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INTERNATIONAL ATOMIC WEIGHTS, 1957.

Order of atomic numbers.

Atomic No.	Name.	Symbol.	Atomic weight.	Atomic No.	Name.	Symbol.	Atomic weight.
1	Hydrogen	H	1·0080	52	Tellurium	Te	127·61
2	Helium	He	4·003	53	Iodine	I	126·91
				54	Xenon	Xe	131·30
3	Lithium	Li	6·940				
4	Beryllium	Be	9·013	55	Cæsium	Cs	132·91
5	Boron	B	10·82	56	Barium	Ba	137·36
6	Carbon	C	12·011	57	Lanthanum	La	138·92
7	Nitrogen	N	14·008	58	Cerium	Ce	140·13
8	Oxygen	O	16	59	Praseodymium	Pr	140·92
9	Fluorine	F	19·00	60	Neodymium	Nd	144·27
10	Neon	Ne	20·183	61	Promethium	Pm	—
				62	Samarium	Sm	150·35
11	Sodium	Na	22·991	63	Europium	Eu	152·0
12	Magnesium	Mg	24·32	64	Gadolinium	Gd	157·26
13	Aluminium	Al	26·98	65	Terbium	Tb	158·93
14	Silicon	Si	28·09	66	Dysprosium	Dy	162·51
15	Phosphorus	P	30·975	67	Holmium	Ho	164·94
16	Sulphur	S	32·066 *	68	Erbium	Er	167·27
17	Chlorine	Cl	35·457				
18	Argon	A †	39·944	69	Thulium	Tm	168·94
				70	Ytterbium	Yb	173·04
19	Potassium	K	39·100	71	Lutetium	Lu	174·99
20	Calcium	Ca	40·08	72	Hafnium	Hf	178·50
21	Scandium	Sc	44·96	73	Tantalum	Ta	180·95
22	Titanium	Ti	47·90	74	Tungsten	W	183·86
23	Vanadium	V	50·95	75	Rhenium	Re	186·22
24	Chromium	Cr	52·01	76	Osmium	Os	190·2
25	Manganese	Mn	54·94	77	Iridium	Ir	192·2
26	Iron	Fe	55·85	78	Platinum	Pt	195·09
27	Cobalt	Co	58·94	79	Gold	Au	197·0
28	Nickel	Ni	58·71	80	Mercury	Hg	200·61
29	Copper	Cu	63·54	81	Thallium	Tl	204·39
30	Zinc	Zn	65·38	82	Lead	Pb	207·21
31	Gallium	Ga	69·72	83	Bismuth	Bi	209·00
32	Germanium	Ge	72·60	84	Polonium	Po	—
33	Arsenic	As	74·91	85	Astatine	At	—
34	Selenium	Se	78·96	86	Radon	Rn	—
35	Bromine	Br	79·916				
36	Krypton	Kr	83·80	87	Francium	Fr	—
				88	Radium	Ra	—
37	Rubidium	Rb	85·48	89	Actinium	Ac	—
38	Strontium	Sr	87·63	90	Thorium	Th	232·05
39	Yttrium	Y	88·92	91	Protactinium	Pa	—
40	Zirconium	Zr	91·22	92	Uranium	U	238·07
41	Niobium	Nb	92·91	93	Neptunium	Np	—
42	Molybdenum	Mo	95·95	94	Plutonium	Pu	—
43	Technetium	Tc	—	95	Americium	Am	—
44	Ruthenium	Ru	101·1	96	Curium	Cm	—
45	Rhodium	Rh	102·91	97	Berkelium	Bk	—
46	Palladium	Pd	106·4	98	Californium	Cf	—
47	Silver	Ag	107·880	99	Einsteinium	Es	—
48	Cadmium	Cd	112·41	100	Fermium	Fm	—
49	Indium	In	114·82	101	Mendelevium	Md	—
50	Tin	Sn	118·70	102	Nobelium	No	—
51	Antimony	Sb	121·76				

* Because of natural variations in the relative abundance of the isotopes of sulphur the atomic weight of this element has a range of ±0·003.

† The International Table uses the symbol Ar for argon but this has not been adopted by The Chemical Society.

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